



HORUS440

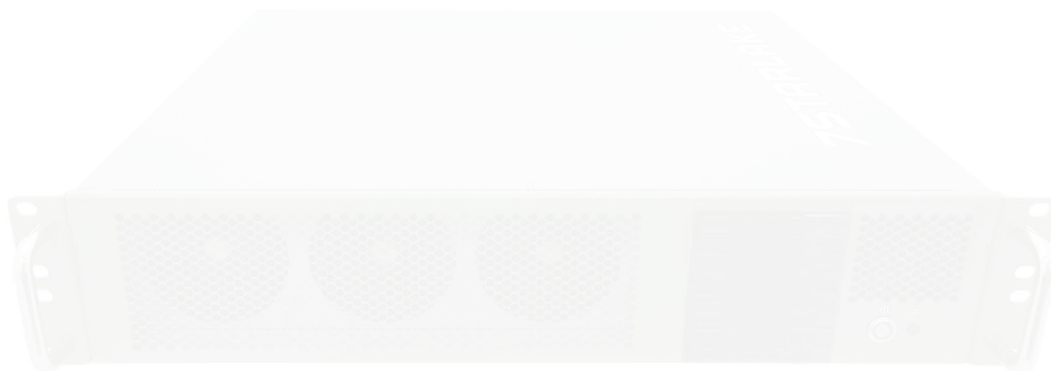
Performance Test Report

Configure A

CPU: Intel Xeon Gold 5420+ (**205W**)
GPU: Nvidia RTX A4500 (**200W**)

Configure B

CPU: Intel Xeon Platinum 8558 (**330W**)
GPU: Nvidia RTX A4500 (**200W**)



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1. SPECIFICATION

1-1. SYSTEM CONFIGURATION A (Gold 5420+ / TDP: 205W)

Motherboard	5th/4th Gen Intel® Xeon® Scalable processors, Single Socket LGA-4677 (Socket E) supported, CPU TDP supports Up to 350W TDP Intel C741® Chipset Up to 2TB 3DS ECC RDIMM, DDR5-5600MT/s (1DPC) in 8 DIMM slots 8 NVMe ports PCIe 5.0 x4 via 4 MCIO connectors
CPU	Intel® Xeon® Gold 5420+ Processor Total Cores: 28 Total Threads: 56 Max Turbo Frequency: 4.1 GHz Processor Base Frequency: 2.0 GHz Cache: 52.5 MB Intel® UPI Speed: 16 GT/s TDP: 205 W
Memory	2 x 8GB DDR5 R-DIMM
Storage	2x 960GB SATA SSD
GPU	Nvidia RTX A4500 GPU memory: 20GB GDDR6 NVIDIA Ampere architecture-based CUDA Cores: 7,168 NVIDIA third-generation Tensor Cores: 224 NVIDIA second-generation RT Cores: 56 Power consumption Total board power: 200 W
Power Module	800W Redundant Power Supply

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1-2. SYSTEM CONFIGURATION B (Platinum 8558 / TDP: 330W)

Motherboard	5th/4th Gen Intel® Xeon® Scalable processors, Single Socket LGA-4677 (Socket E) supported, CPU TDP supports Up to 350W TDP Intel C741® Chipset Up to 2TB 3DS ECC RDIMM, DDR5-5600MT/s (1DPC) in 8 DIMM slots 8 NVMe ports PCIe 5.0 x4 via 4 M.2 connectors
CPU	Intel® Xeon® Platinum 8558 Processor Total Cores: 48 Total Threads: 96 Max Turbo Frequency: 4.0 GHz Processor Base Frequency: 2.1 GHz Cache: 260 MB Intel® UPI Speed: 20 GT/s TDP: 330 W
Memory	2 x 8GB DDR5 R-DIMM
Storage	2x 960GB SATA SSD
GPU	Nvidia RTX A4500 GPU memory: 20GB GDDR6 NVIDIA Ampere architecture-based CUDA Cores: 7,168 NVIDIA third-generation Tensor Cores: 224 NVIDIA second-generation RT Cores: 56 Power consumption Total board power: 200 W
Power Module	800W Redundant Power Supply

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2. TEST PLAN

2.1. THERMAL MEASUREMENT PROCESS

Test Purpose	<p>The purpose of performing thermal profile testing is to identify potential thermal issues with the EUT. Considering that semiconductor failure rates rise rapidly with increasing junction temperature, it can aid product reliability assessment.</p> <p>As the system cools down, the mode will change with stack selection, temperature/heat.</p> <p>Mapping can help develop the best tracking arrangements.</p>																														
Test Equipment	1. KSON THS-B4T-150 Chamber.																														
Quantity Tested	Minimum 1 Set																														
Test Software	1. Stress CPU: PassMark Burn-in Test Software Ver 9.0 2. Stress GPU: AIDA64 extreme 690																														
Test Procedure	<ol style="list-style-type: none">1. Thermal pre-scan measurement: Temperature: 25°C~50°C Humidity: 60%RH (Temperature above 25°C)2. Actual thermal measurement:<ol style="list-style-type: none">2-1. Select the test point based on the infrared photo and connect the thermocouple to the hot spot.2-2. Place the EUT into the hot chamber and set the test temperature curve Specification.2-3. Open the hot cell and power up the EUT, enter the Windows Server 2022 Standard Evaluation (Version 10.0.20348 Build 20348) environment and perform a maximum power test and stress test.2-4. After the EUT executes the test software for 8 hours, record the maximum heat generation of each thermocouple point.2-5. Turn off the hot cell and EUT.2-6. Verify and check that the recorded information for each component complies with the operating temperature range listed in the specification/approval sheet for each component being tested.																														
Test Diagram of Curves	<p>Environment defines for 51 hours.</p> <table border="1"><caption>Temperature Profile Data</caption><thead><tr><th>Time (hour)</th><th>Temperature (°C)</th></tr></thead><tbody><tr><td>0</td><td>25</td></tr><tr><td>8.5</td><td>25</td></tr><tr><td>16.5</td><td>30</td></tr><tr><td>17</td><td>30</td></tr><tr><td>25</td><td>35</td></tr><tr><td>25.5</td><td>35</td></tr><tr><td>33.5</td><td>40</td></tr><tr><td>34</td><td>40</td></tr><tr><td>42.5</td><td>45</td></tr><tr><td>42.5</td><td>45</td></tr><tr><td>51</td><td>50</td></tr><tr><td>51</td><td>50</td></tr><tr><td>51.5</td><td>25</td></tr><tr><td>51.5</td><td>25</td></tr></tbody></table>	Time (hour)	Temperature (°C)	0	25	8.5	25	16.5	30	17	30	25	35	25.5	35	33.5	40	34	40	42.5	45	42.5	45	51	50	51	50	51.5	25	51.5	25
Time (hour)	Temperature (°C)																														
0	25																														
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2.2. TEST RESULT <TEST ITEM>

2.2.1. Temperature Cycle

Aging test of various parts at different temperatures under maximum load and full load conditions.

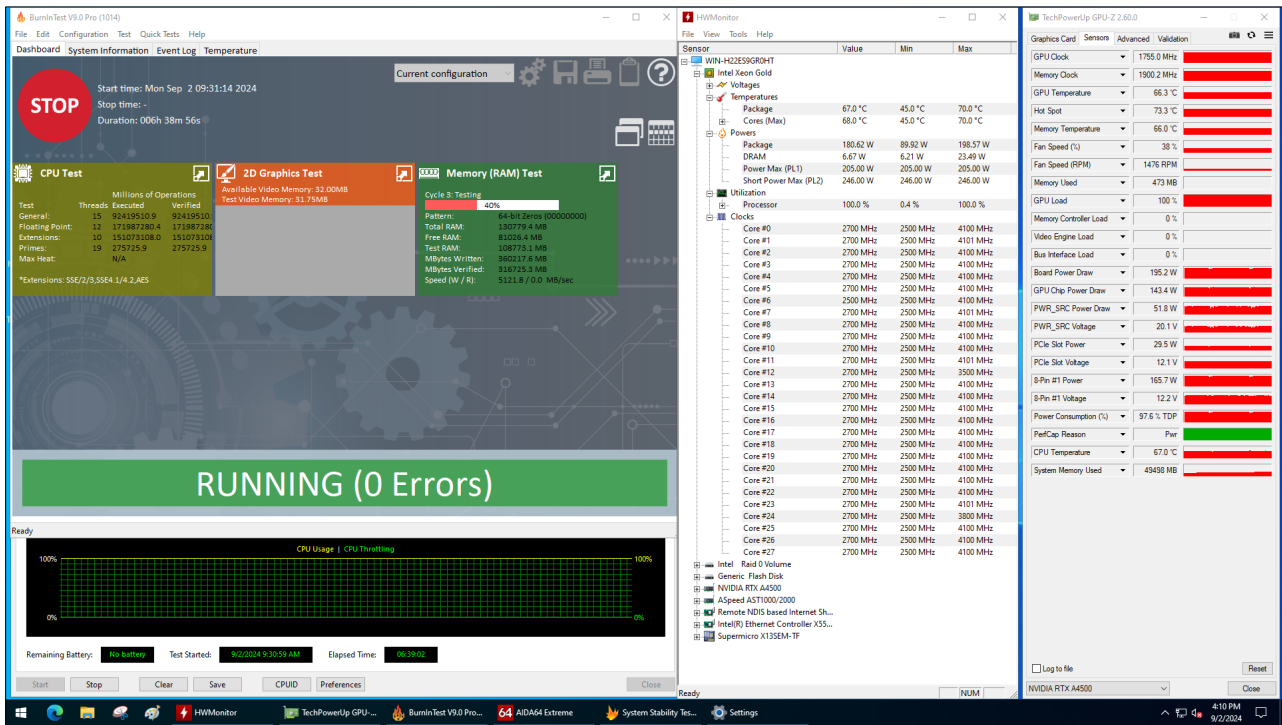
Test Temperature	Test Result
25°C / 60%RH	PASS
30°C / 60%RH	PASS
35°C / 60%RH	PASS
40°C / 60%RH	PASS
45°C / 60%RH	PASS
50°C / 60%RH	PASS

Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

3. TEST PHOTO IN LAB

- Chamber in 25°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

- Chamber in 30°C / 60%RH

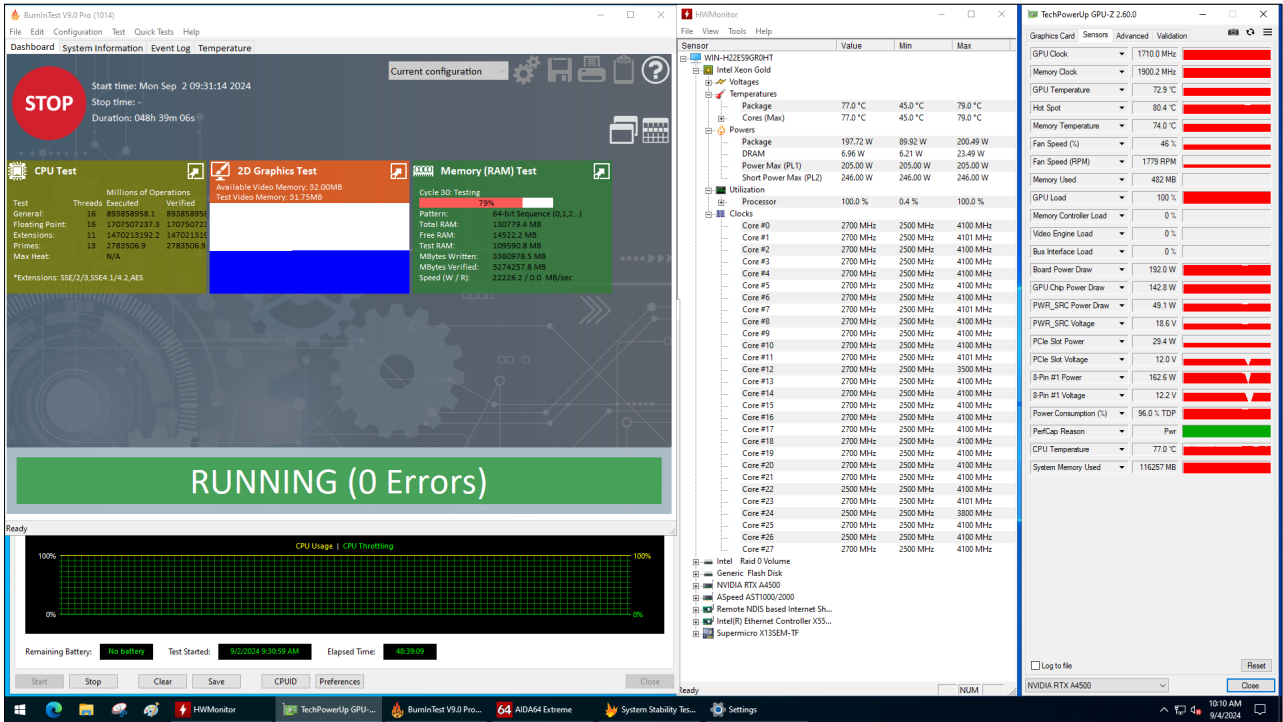
The screenshot displays three software windows during a performance test. The main window, 'BurnInTest V5.0 Pro (10/4)', shows a 'STOP' button and a 'RUNNING (0 Errors)' status. It includes sections for 'CPU Test' (Millions of Operations, Threads, Verified), '2D Graphics Test' (Available Video Memory, Test Video Memory), and 'Memory (RAM) Test' (Cycle 28-Testing, Pattern, Total RAM, Free RAM, Test RAM, MBytes Written, MBytes Verified, Speed [W/R]). A 'Ready' section shows 'CPU Usage | CPU Throttling' at 0%. The 'HWMonitor' window shows sensor data for 'WIN-H22E596R0H1', including temperatures (70.0°C), powers (172.78 W), and clocks (2700 MHz). The 'TechPowerUp GPU-Z 2.60.0' window shows GPU clock (1725.0 MHz), memory clock (1900.2 MHz), GPU temperature (69.8°C), fan speed (42%), and power consumption (95.8% TDP).



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

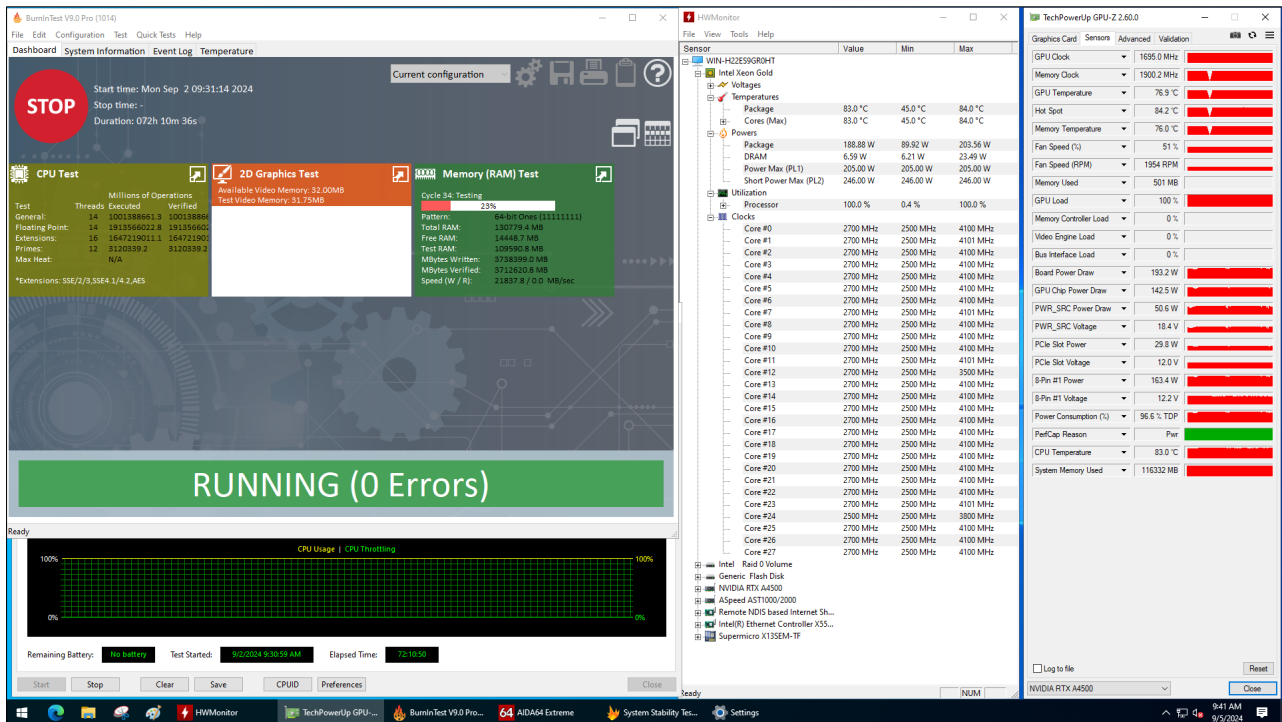
- Chamber in 35°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

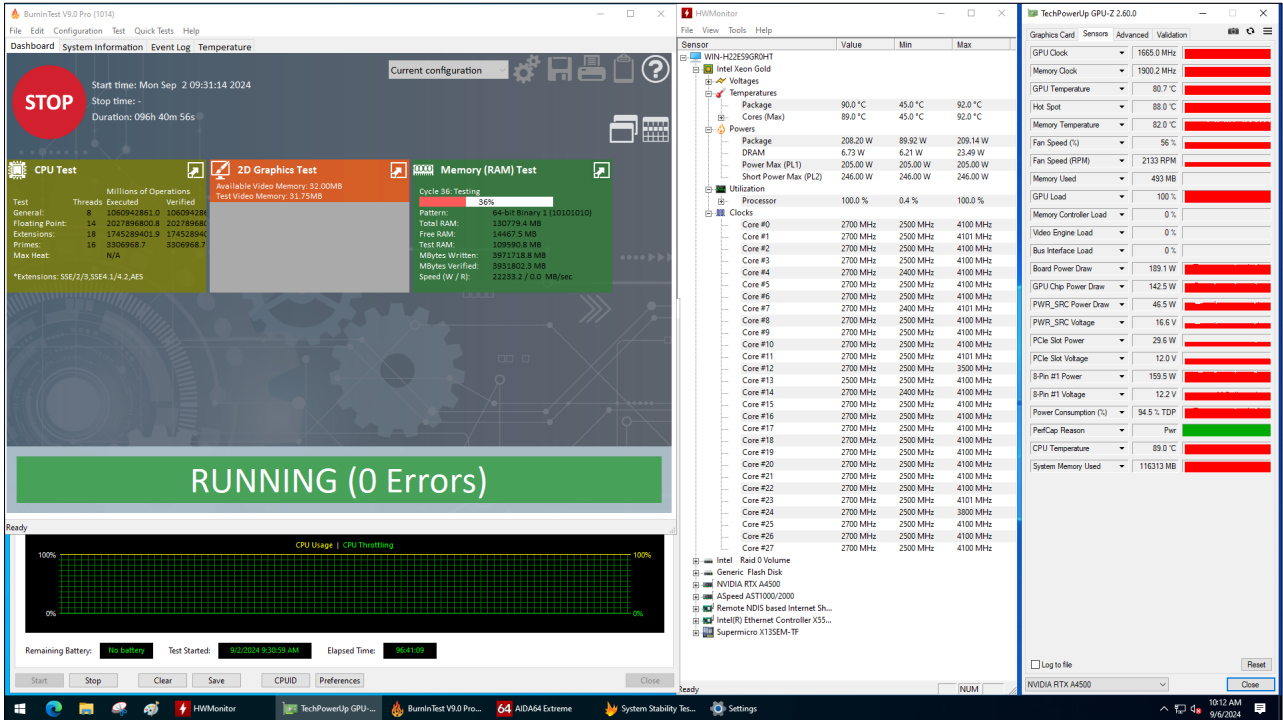
- Chamber in 40°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

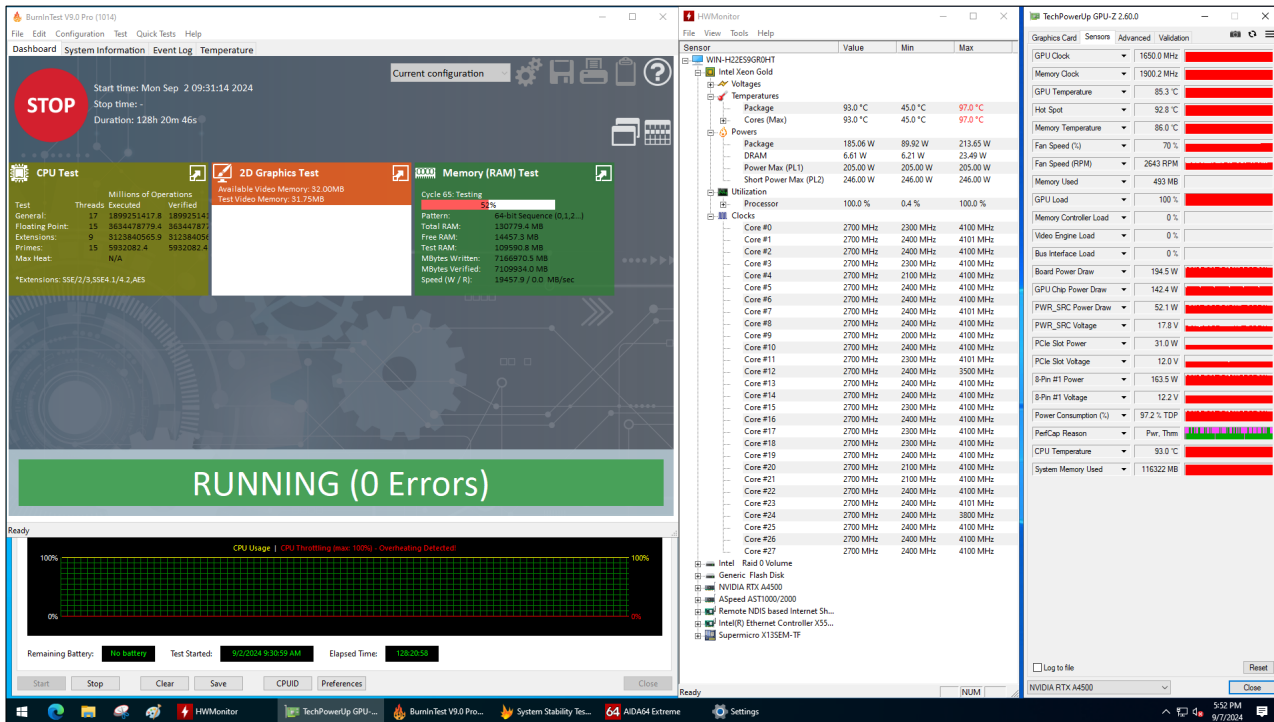
- Chamber in 45°C / 60%RH



Performance Test

HORUS440 Configure A: Gold 5420+ processor (TDP: 205W)

- Chamber in 50°C / 60%RH

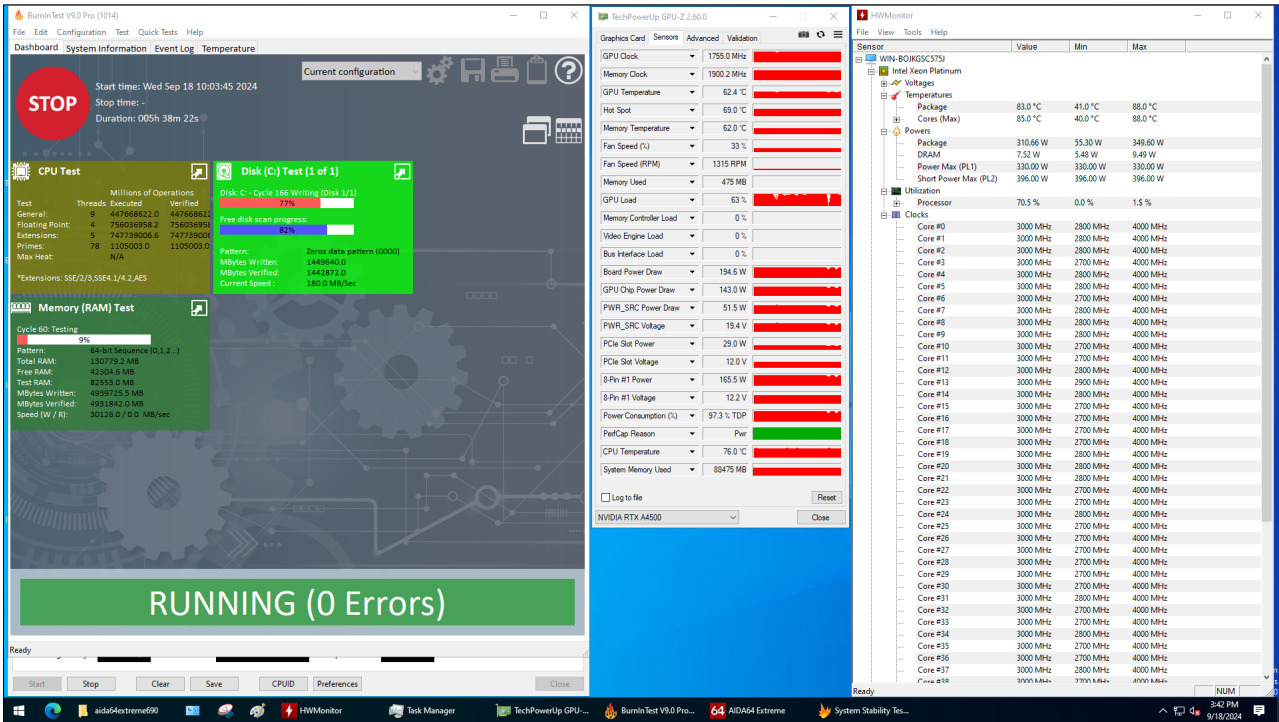


Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

4. TEST PHOTO IN LAB

- Chamber in 25°C / 60%RH



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

- Chamber in 30°C / 60%RH

The screenshot displays a performance testing interface with several active windows:

- BurnInTest V9.0 Pro (1014):** Shows a 'STOP' button and test progress. CPU test is at 70% completion. Memory (RAM) test is at 55% completion. A 'RUN' button is visible at the bottom.
- TechPowerUp GPU-Z 2.60.0:** Shows GPU specifications for the Intel Xeon Platinum 8558, including GPU Clock (1740.0 MHz), Memory Clock (1900.2 MHz), GPU Temperature (65.9 °C), and Fan Speed (37%).
- HWMonitor:** Displays sensor data for the Intel Xeon Platinum processor, including temperatures (90.0 °C), power consumption (318.79 W), and clock speeds (3000 MHz).
- Task Manager:** Shows the CPU usage for the INTEL(R) XEON(R) PLATINUM 8558, with 100% utilization and a speed of 2.98 GHz.



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

- Chamber in 35°C / 60%RH

The screenshot displays a performance testing environment with several windows open:

- BurnInTest V9.0 Pro (1014):** Shows a 'STOP' button and test results for CPU and Memory (RAM) tests. The CPU test is completed with 100% utilization across all logical processors. The Memory test is also completed.
- TechPowerUp GPU-Z 2.60.0:** Shows GPU specifications for the NVIDIA RTX 4090, including a clock speed of 1725.0 MHz and a power draw of 192.4 W.
- HWMonitor:** Displays a detailed list of system sensors, including temperatures (Package: 95.0°C, Cores: 96.0°C), power consumption (Package: 321.00 W), and core clock speeds (ranging from 2900 MHz to 3000 MHz).
- Task Manager:** Shows the CPU running at 100% utilization at 2.98 GHz, with 127 processes and 45269 handles.



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

- Chamber in 40°C / 60%RH

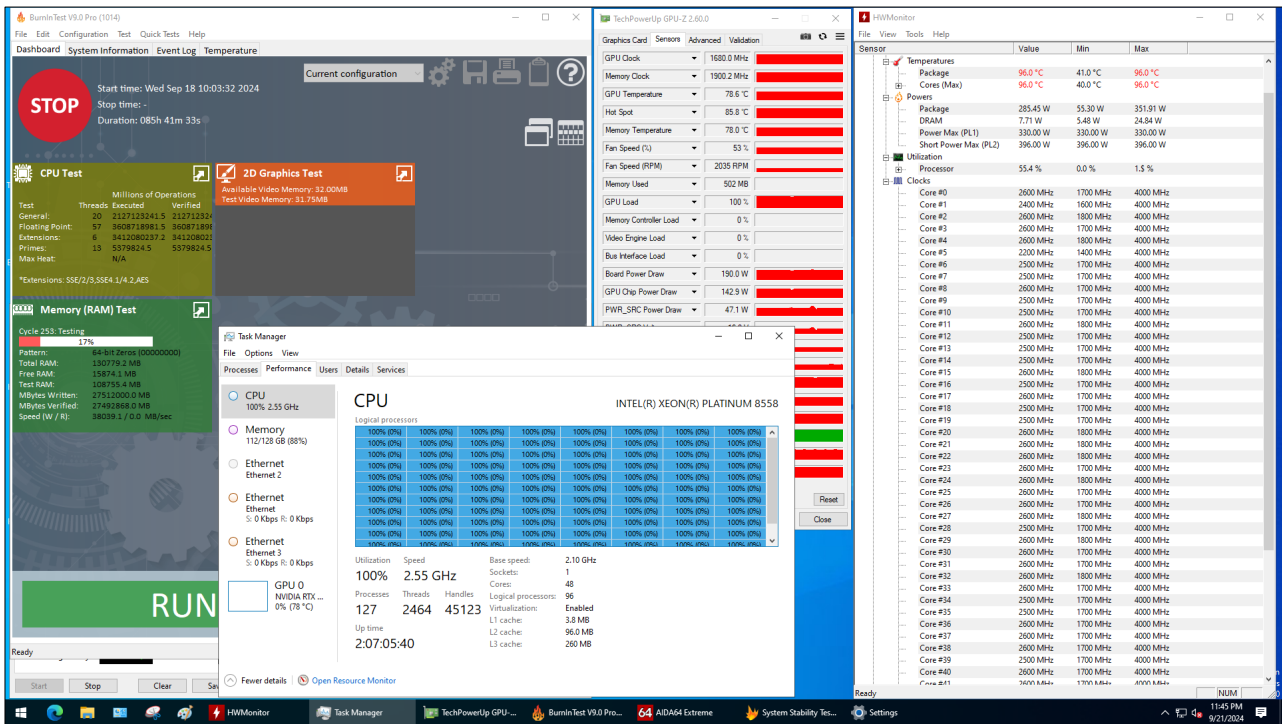
The screenshot displays a Windows desktop with several performance monitoring applications running. On the left, BurnInTest V9.0 Pro (1014) is in the foreground, showing a 'STOP' button and test results for CPU and Memory (RAM) tests. The CPU test shows 100% utilization across all logical processors. The Memory test shows 19% utilization. In the center, Task Manager is open to the Performance tab, showing the CPU at 100% utilization and 2.79 GHz. On the right, TechPowerUp GPU-Z 2.6.0.0 is open, showing GPU clock at 1710.0 MHz and memory clock at 1900.2 MHz. HWMonitor is also open, showing a list of sensors with temperatures at 96.0°C and power consumption at 330.00 W.



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

- Chamber in 45°C / 60%RH



Performance Test

HORUS440 Configure B: Platinum 8558 processor (TDP: 330W)

- Chamber in 50°C / 60%RH

The screenshot displays a Windows desktop with several performance monitoring applications running. On the left, BurnInTest V9.0 Pro (1014) is in the foreground, showing a 'STOP' button and test results for CPU and 2D Graphics tests. The CPU test shows 7 threads executed, and the 2D Graphics test shows available video memory of 22,800MB and tested video memory of 31,754MB. In the center, TechPowerUp GPU-Z 2.6.0.0 shows the GPU is an Intel Xeone Platinum with a memory clock of 1900.2 MHz and a GPU temperature of 83.0°C. On the right, HWMonitor displays a detailed list of sensors for the Intel Xeone Platinum, including temperatures for the package (96.0°C), DRAM (7.54 W), and various core temperatures (41.0°C to 96.0°C). The Task Manager window shows the CPU is running at 100% utilization at 2.22 GHz, with 124 processes and 2445 threads. The system tray shows the time as 3:27 PM on 9/23/2024.



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5. THERMAL TEST RESULT(25°C ~ 50°C)

Configure A: CPU Xeon Gold 5420 + (205W) / GPU A4500 Temperature and Frequency

Temperature / Frequency	Ambient Temp.	25°C 60% RH	30°C 60% RH	35°C 60% RH	40°C 60% RH	45°C 60% RH	50°C 60% RH
CPU Cores Max Temperature (Unit: °C)		68.0	70.0	77.0	83.0	89.0	93.0
CPU Cores Frequency (Unit: GHz) <small>Processor Base Frequency: 2.00 GHz</small>		2.70	2.70	2.70	2.70	2.70	2.70
GPU Temperature (Unit: °C)		66.3	69.8	72.9	76.9	80.7	85.3
GPU Hot Spot Temperature (Unit: °C)		73.3	77.2	80.4	84.2	88.0	92.8
GPU Frequency (Unit: MHz) <small>GPU Base Frequency: 1050MHz</small>		1755	1725	1710	1695	1665	1650

Configure B: CPU Xeon Platinum 8558 (330W) / GPU A4500 Temperature and Frequency

Temperature / Frequency	Ambient Temp.	25°C 60% RH	30°C 60% RH	35°C 60% RH	40°C 60% RH	45°C 60% RH	50°C 60% RH
CPU Cores Max Temperature (Unit: °C)		85.0	90.0	96.0	96.0	96.0	96.0
CPU Cores Frequency (Unit: GHz) <small>Processor Base Frequency: 2.10 GHz</small>		3.00	3.00	3.00	2.80	2.60	2.30
GPU Temperature (Unit: °C)		62.4	65.9	69.4	74.6	78.6	83.0
GPU Hot Spot Temperature (Unit: °C)		69.0	72.9	76.6	81.7	85.8	89.9
GPU Frequency (Unit: MHz) <small>GPU Base Frequency: 1050MHz</small>		1755	1740	1725	1710	1680	1650

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